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Tree Butchers.

IN one of the cities of New Jersey we saw last week a row of Norway Maples where the professional tree pruner had been at work. These trees had been planted more than twenty years, and had made a good even growth, branching some eight feet above the walk from straight trunks which are now about a foot in diameter. All the large limbs had been sawed off a few feet from the trunk, and from the remnants of these limbs an occasional stub was left projecting, so that practically nothing remained of what once was a tree but a mutilated stump. All the trees were literally ruined, and ruined, too, by those who meant to do a friendly act—ruined, through ignorance, by the very process which was intended to prolong their lives and add to their beauty and usefulness.

The men before whose grounds street-trees are planted usually know nothing about them, and cannot even call them by name, so that when a pair of these professional trimmers, with their equipment of ladders, saws and axes, appear, the proprietor is likely to be impressed with the superior knowledge of these supposed experts, and when they assert that the trees are all growing out of shape, or that their vigor needs to be re-enforced by some pruning, he surrenders at once, and the amputation begins. What will happen next year is that the tree, in its effort to make good its loss of vital organs, will send out from adventitious buds a profuse growth of slender twigs, and these will carry an abundance of leaves, so that the stump will uphold a globular mass of foliage. These leaves will help to prolong the life of the tree by digesting the food taken up by the roots, and although they will appear rank and vigorous, they are premonitions of death rather than promises of new life. Fungi will attack the raw wounds at the extremities of the amputated limbs, and they will begin to rot. The decay will soon eat its way down to the base of the branches, and these will fall. The trunk itself will then be attacked, and the disfigured tree is doomed to certain and early death.

Now, street-trees sometimes need pruning. If, however, they have been originally well selected, a small knife will be all that is necessary, for a few years, to remove an occasional branch that starts out in the wrong place. There is rarely any necessity of cutting off a large limb. If this necessity ever does come, the limb should be cut off close to the trunk and the place smoothed over and painted, so that the wound will be ultimately covered with healthy bark. We have often explained that wherever a stub is left this must inevitably die, and as the trunk grows about it there will be a plug of rotted wood where the branch originally grew, and the disease will eat inward and downward as the water soaks in from without. After street-trees have attained mature size, pruning is rarely needed beyond the occasional cutting away of a dead branch or the removal of one which interferes with another.

In most cities property-owners are not permitted to cut down a tree along the street front of their own grounds without the permission of the city authorities. In many of these same cities, however, every owner has a right to prune his trees, and when such an owner listens to the persuasions of the professional trimmer, his trees, which have been fortunate enough to survive the attacks of the various corporations which operate wires and chop off branches which seem to be in their way, are menaced with a still greater danger. The truth is that the street-trees of every city and town should be in charge of some officer who is acquainted with their requirements. The superintendence should begin before the trees are planted. The officer should see that no species are planted which are not suitable for street-trees, and that only well-grown and healthy individuals of these species are selected. They should then be planted at proper distances and with all due care. They should have constant supervision and protection not only against the attacks of insects and disease and injuries inflicted through wantonness or carelessness, but against the wounds of ignorant pruners. Better have no street-trees whatever than trees which have been abused until they are objects of pity.

IT lacks some months yet of being two years since the act was passed which conferred upon the President the authority to proclaim reservations of forest-lands. Six reservations have already been made, and, altogether, 4,500,000 acres of timber-land have thus been set apart, while twenty-six other locations are under examination by the General Land Office for the same purpose. This withdrawing of forest-land from sale is the first essential step toward any successful policy for preserving the public timber-lands, but, as we are just reminded by a circular of the American Forestry Association, the true policy is not one of total exclusion from forest-land, but rather of opening such land for rational use; that is, forest-lands must not only be protected from fire and plunder, but provision must be made for cutting the timber under proper supervision and precaution, so that the forests will serve their highest purpose in the present without any injury to their future. The eleventh annual meeting of the American Forestry Association will be held at Washington on the 20th of the present month, and the aim will be to prepare for some efficient administration of the public timber-lands which have been or are to be reserved. The bill of Senator Paddock, which is now on the calendar of the Senate, contains many good provisions, and is an improvement on all former bills which have looked toward a comprehensive administration of our forest-domain. The present meeting will be largely devoted to a consideration of this bill, with efforts to secure the passage of such of its provisions as seem to be of immediate necessity. Nothing but good can come from a full and public discussion of the merits of the measure now before the Senate, and it is to be hoped

that the meeting will be fully attended by representative men who are interested in the establishment of a wise national forest-policy.

In no part of the world are so many Mushrooms raised for the market as in the vicinity of Paris, where they are cultivated in the long subterranean quarries which produce the stone of which the better houses in Paris are built, and probably nowhere else is so much skill and intelligence shown in the management of the Mushroom-beds. Occasionally the plants are attacked with parasitic diseases, and the Mushroom-growers are quick in recognizing the first appearance of several different maladies. Professor Costantin, of the Ecole Normale Supérieure, has recently made a scientific study of Mushroom-diseases, and has been able to detect the causes of several of them.

The two principal diseases are popularly known as the molle and the goutte. In the molle, or mole as the name is now more frequently spelled, the growing Mushrooms are much distorted, at times so much so that the gills and top of the mushroom can no longer be recognized, and it looks more like a small round puff-ball. The molle is due to the growth of parasitic fungi known to botanists as Mycogone and Verticillium, forms which are stages of development of species belonging to the genus Hypomyces. The goutte, a disease which, apparently, does less harm than the molle, is recognized by the appearance of drops from the size of a pin-head to that of a pea, followed by discolorations on the surface of the mushroom. Professor Costantin believes that the goutte is caused by the growth of bacteria.

Professor Costantin has also studied the diseased conditions of the spawn, what is called by the French le blanc, used in starting the Mushroom-beds. What is called the vert-de-gris, from its color, is due to the growth of a new species of fungus, Myceliophthora lutea. The plâtre, which makes the beds look as if they had been powdered with plaster, is due also to a new species, Verticilliopsis infestans. Besides the chanci, recognized by the rancid odor, which causes trouble in winter, there is a small gnat which is very destructive to the Mushroom-crop in some of the quarries.

New England Parks.

THE PROJECTED PARK SYSTEM OF PROVIDENCE, RHODE ISLAND.

THE beautiful city of Providence has awakened to a sense of the importance of preserving some of the picturesque forest-land lying at her gates, before it is too late to acquire it at reasonable rates. Certain public-spirited gentlemen, recognizing the great advantages of the situation, have combined to urge upon the city government the purchase of some fine points along the Blackstone River and the bay, and have in energetic publications set forth the wisdom of adding to the land already acquired, other well-wooded and historical regions, so that in time a connected system of parks and parkways may wholly encircle the town, and render it a more attractive dwelling-place than ever.

For such a system the city is exceptionally endowed by its surroundings of hills and water. At its southern end it touches upon Narragansett Bay; the broad Seekonk flows along its eastern border; on the north-west and north are chains of lakes connected by streams; on the south and south-west large ponds lie close to Roger Williams Park. There are, besides, numerous little rivers which flow from the neighboring hills in the upper part of the town, and the broad estuary, known as the Providence River, which makes up into the heart of the city, where it is crossed by bridges. The residences of the richer portion of the population are situated upon the brow and slopes of a steep hill, from which an extensive prospect is commanded, while the business portions lie below, along and across the river, with a broad plain, in which to expand, stretching away to the south and west. Here in the business centre is a tidal basin, known as the Cove, which is being filled up at great expense, some authorities think to the detriment of the river, which needs just this basin to catch the deposit of the tides, and prevent the shallowing of the channel. A great and wise effort was made to turn this reclaimed land into a pleasure-ground by retaining a part of the tide-flow by means of gates, and surrounding these lakes with trees and greensward, in which case it would have afforded an attractive breathing-place in the very heart of the city. But the property has largely passed into the hands of the railroad company, and will probably ultimately be devoted to screaming and smoky engines and to rattling cars. Fortunately, the opportunities of the outskirts are sufficient to still afford spacious grounds in all directions, to which communication by land and water will be easy, if the projected park system is carried out, as it bids fair to be.

At present the only large cultivated park that Providence possesses is the tract which will soon amount to about 400 acres, known as Roger Williams Park; 104 acres of this land were bequeathed to the city in 1871 by the will of Betsey Williams; it is diversified with hills and dales, trees, lawn and water. There are fine woods of Oak and Pine, a large artificial lake of thirteen acres, adapted for boating in summer and thronged with skaters in winter, and near at hand is a large sheet of water known as Cunliff Pond, which will form a most beautiful addition to the grounds when the necessary arrangements for incorporating it into the present area are completed. The house, 123 years old, formerly inhabited by the testator, is still preserved in the grounds—a quaint old-time cottage furnished in antique fashion, and now used as a retiring-room for mothers with children.

Near the entrance is the statue of Roger Williams, by the Rhode Island sculptor, Simmons, representing that worthy high in air, with the muse of history writing his name upon a tablet at the base of the pedestal. Other sculptures ornament the park, among them a bust of King Ferdinand of Naples, the last Bourbon king, which was brought home from Naples, after Bomba's flight, by an enterprising citizen, who purchased it when it was rescued from the enraged populace, and buried to prevent its destruction. After serving as a rather incongruous ornament of the front yard of the proprietor for some years, it was transferred to these leafy shades, where it must afford much satisfaction to the Neapolitan organ-grinders when they take their recreation in the park. There is near the entrance a building where wild animals are accommodated, and hard by the playful buffalo disports himself with deer in a private yard of his own, his attentions having proved too much for his former companion, a goat, whom he once lifted over the fence in his high spirits, and put an end to him forever. The deer, being more nimble, are able to elude him when he attempts the same pleasantries with them, and the noble antlers of one of the stags looked as if two might play at the game of hooking, should the buffalo be again inclined that way.

A prettier sight than this park in the winter-time when snow is on the ground it would be hard to find. A broad road, some three miles in extent leads to it, which is thronged with the fine equipages for which Providence is famous. The sleighs jingling with bells drive with speed over the course, and then circle about the pond, while their occupants amuse themselves from amid their furs by a sight of the gay figures of the skaters, who come and go among the trees which branch over them, and follow in their flight the graceful windings of the icy course over which they skim. It is like a miniature Bois de Boulogne, with all this luxury and joyous sport, this kaleidoscope of moving figures, the trees bordering the drive-way, the foot-passengers gathering in groups to watch the flying skaters, and here one best recognizes the wealth for which this growing city is famous, and the general well-to-do condition of its inhabitants.

In addition to this park, which is greatly prized by the citizens and which the proposed additions will render a really important pleasure-ground, the city has recently acquired the Thomas Davis estate, a tract of thirty-five acres, lying within its limits, about a mile from the city hall. This charming spot, happily diversified with woods, meadow, upland, hill-side and ravine, and easily accessible by horse-cars, is a most desirable possession for any town. A forest of a century's growth ornaments the steep hill-side and ravine, through which a running brook finds its way, and from the plateau, which stretches away to the south, in front of the stone house formerly occupied by Mr. Davis, there is a beautiful view of the valley of the Woonasquatucket, the surrounding hills, and the city itself, with its clustered houses and its manufactories. The steep sides of the ravine, at the bottom of which the brook flows, are heavily wooded, and the rounded knolls approaching the ravine add to its picturesque beauty. The woods, which cover some acres of the grounds, abound in Oaks, Hickories, Birches, Chestnuts, with a mingling of Ashes, Elms, Maples, Hornbeams and other varieties, while Pines and Hem-

locks and Cedars add to the charm of the spot in winter-time. The largest Canoe Birch in the state stands at the foot of the bank, not far from the stone bridge, and there is a fine variety of shrubbery scattered about the place in pleasing groups.

Upon the borders of the Seekonk River, in the hilly eastern portion of Providence, a beautiful little promontory, containing about five acres, has been presented to the city by two citizens, Mr. W. P. Vaughan and Mr. Moses B. Jenkins. This wooded bluff, still wild and uncultivated and abounding in Oaks, fronts upon the Seekonk River, and commands a delightful view of that broad stream and its banks. It is called Blackstone Park, and a drive along the shore is in contemplation, which, when developed and extended past the spacious grounds of the Butler Hospital, which kindly consents to the use of its long river-front for this purpose, will furnish a most attractive promenade for carriages, bicycles and pedestrians. This parkway, called the Eastern Boulevard, will be a mile and three-quarters in length, and is to be two hundred feet wide, the central portion to be ornamented, and on each side a driveway forty feet wide. Through the ornamented portion a cable-road will be run, and provision made for foot-passengers. This drive, it is hoped, will be extended by Pawtucket, to whose borders it leads, for a corresponding distance through its own territory. In summer little steam pleasure-boats can easily run along the river to Field's Point, now belonging to the city, which is at present an uncultivated sandy cape running out at the point where the Seekonk, otherwise known as the Blackstone, empties into Narragansett Bay. This point, when properly planted and laid out as a pleasure-ground, will form a healthful and cool resort for the crowding inhabitants of the south-eastern portion of the city, and is separated from the Roger Williams Park additions by only a short drive, that could readily be made available as a parkway. It commands a fine view up the river and down the broad bay.

Numerous squares of one or two acres are scattered about the city as welcome breathing-places for the tired inhabitants, but the public-spirited gentlemen who have done such good work in the past have still more comprehensive schemes for the future. The Public Parks Association, with the enthusiastic and energetic head of the Friends' School, Mr. Augustine Jones, as its President, are urging the purchase of a great open space on the north of the city, formerly occupied as an encampment by the French in the time of the Revolution. Here are the cellars of the dwellings they once occupied, and, as Rochambeau Park, this fine tract with its wild landscape, is capable of becoming by cultivation a worthy monument to our old allies. On the north-west side of the city is a stretch of young timber of some seventy acres, known as the Bradley Woods. Among the young and thrifty trees are some venerable specimens of the former forest, and here it is hoped that the city will acquire another park which will be found already provided with a carefully tended forest of some fifty years' growth. From this point a fine view is to be obtained with a far-away hilly background.

Not satisfied with this even, the Park Association is agitating for the acquirement of a hill called Neutaconkanut, which is the end of a high promontory of land, projecting to the south from a range of hills into the large plain which surrounds Providence on the west and south. This hill is about 300 feet above tide-water, and at its base flows the foaming Pocasset River at a higher elevation, making the mean height above the upper plain about 200 feet. This hill was mentioned in the original deed from the Indians to Roger Williams as "Ye greate hill of Notquonchanet on the north-west," and was one of the bounds of the purchase, so that it is of classic interest to the Rhode Islanders. It is already a popular resort for thousands, who make excursions thither for the sake of the noble view which it commands, and to enjoy its fine natural advantages of trees and rocks and rills. There are three summits to the hill, and from the highest of these the eye stretches away south-westward over the closely clustered villages of the little state. Thornton and Cranston, Natick and Pontiac and West Greenwich, with their neighboring hills, are visible, and far-away Cowesset Bay, and the white sails in the West Passage, with the islands scattered here and there. On a clear day Newport itself is visible, and the whole extent of the island of Rhode Island. To the east are more villages, and Providence River in its whole brief extent, from Rocky Point to the city, with the mill-covered hills of Fall River in full view. Then more hills, and Providence itself, with its extended suburbs, its busy factories, its lofty spires; while northward the view is bounded by other ranges of hills, until we are conscious that we are looking upon one-fourth of the area of the thriving little state, and have in view the homes of seven-eighths of its swarming and prosperous inhabitants. From the other summits one can see an equally striking spectacle of beauty and prosperity, one of the most pleasing being that of the fertile Pocasset valley, with its hundreds of acres of cultivated land, its farms and farm-houses and tiny villages. Through this valley winds a road which divides it, and bounding it on the west rises a darkly wooded range of hills stretching from north to south.

"Probably no spot in Rhode Island," writes the President of the Park Association, "equals this in those attractions which are the essential requisites of a rural park. Few have a more attractive outlook. Its beauties are natural, just as God made them. Huge rocks crop out boldly in various localities. Rocks, summits, hillocks, valleys and ravines seem to have taken their places without order, yet are they the more picturesque and varied. No building encumbers it, . . . thrifty woods have sprung up over an extensive area of the hill. Pure water flows from never-failing springs. The views from its summits of cities, country, wooded valleys and shining sea are far-reaching and grand. Add to this the great rocks and lovely ravines running down the slopes of this hill, and the whole combines in furnishing the natural beauties and essentials of a unique and noble park."

If the city of Providence avails itself of its advantages it will soon be unrivaled as a possessor of desirable recreation-ground. Its own singular beauty of situation demands the retention of such open spaces as may command the lovely prospect that opens about it in all directions. Prosperous, comfortable, growing with rapidity in extent and population, the chief city of Rhode Island does well not to fall behind in the march of taste and improvement which has begun in our land.

Hingham, Mass. *M. C. Robbins.*

The Weeping Spruce.

IT had been my desire for the last three years to visit the group of Weeping Spruce (Picea Breweriana) growing on the summit of the Siskiyou Mountains, in Siskiyou County, California, and having learned this year that the other conifers in the northern part of the state were seeding I determined to visit the grove and obtain seed, if possible. In company with my father, Mr. Robert Douglas, of Waukegan, Illinois, we went to Grant's Pass, Oregon, the nearest railroad station to the grove, where we procured horses and drove the first day to Andersons, about twenty miles from Grant's Pass. Owing to heavy rains we did not reach Waldo until about four o'clock next day, where we engaged a guide, saddle-horses and pack-animals, and left for the trees early the morning after, reaching the "Big Meadows," on the summit of the Siskiyous, about four o'clock, having traveled about twenty-one miles in a horizontal direction and more than one mile in altitude. Waldo is about 1,500 feet above sea-level, and our camping-place was about 7,500 feet. The trail over which we came was made by a Spanish packer for the transportation of provisions from Waldo, Oregon, to Happy Camp, a mining town in California. It is a fair trail for such a rough country, but it is not a macadamized road. We slept that night with some evergreen boughs under us and the blue sky over us part of the night, and the most dense fog I have ever seen for the remainder of the night.

The next morning we walked up the trail about a mile and a half to the few scattering Weeping Spruces, about sixty in number, which had attained a height of twenty-five feet, at which size they begin to bear seed; but we found that most of the trees under fifty feet had very imperfect seeds. The cones are from two and a half to three and a half inches in length and three-quarters of an inch in diameter, of a fine purplish color. They mostly grow on the extreme top and ends of upper branches. The beauty of the trees far surpassed my expectations. They have the true Spruce form, tall and symmetrical, with horizontal branches, and a beautiful green color. In their general features they resemble a well-grown Norway Spruce, but their distinguishing beauty is in their long, pliant, pendulous branchlets, which hang straight down from the branches to a length of six or eight feet on the older trees, while they are no larger round than a lead-pencil (see page 595). They have a stately grace in calm weather, but their characteristic impressiveness is only seen when the long flexible branches are undulating in a light breeze or streaming before a gale.

The bark of this Spruce is thin, smooth and reddish in color; the wood is white and very tough. The tree felled several years ago by Mr. T. S. Brandegee for the Jesup collection shows no sign of decay as yet. The largest tree in this grove—if grove it can be called, where the trees are scattered over a space of fifty acres, mixed with Firs and Incense Cedars—we found to be by actual measurement 121 feet 6 inches high,

with a trunk two feet eleven inches in diameter seven and a half feet from the ground. Below that height the trunk swelled to a much greater size. Other trees were more than ninety feet high, with about the same diameter. My father left for San Francisco on the second day, but as the trees were seeding heavily I remained ten days longer and collected 800 pounds of cones, out of which we will get some twenty pounds of fine clean seed, the first, I believe, ever collected. I found another grove of about twenty trees some two miles from this one, but could see very few seedlings in either place. In both groves the trees were growing on the north side of the highest peaks, where the snow lies fifteen or twenty feet deep, as the mail-carriers' signs show, and I can therefore believe the Weeping Spruce will be hardy in most parts of the east.

Later in the season I made another trip to these groves to get as many seedlings as I could, and hunt up more trees if possible. Hunters and prospectors reported that they grew in various parts of the mountains, but when these men saw the branches I brought down they admitted their mistakes. Mr. Orrin Russell, who has lived in this part of the country for more than twenty years, and who is exceptionally well informed, reported that a few Weeping Spruces grew on the Coast-range in Oregon. I visited him at his mines after I had collected and shipped the few seedlings I could find on the Siskiyou Mountains, and in company with his brother, Mr. Joseph Russell, found the trees at the place indicated—on the summit of the Coast-range, on the divide between Cañon Creek and Fiddler's Gulch. This is the first time, so far as I know, that any record has been made of these trees in Oregon. We also discovered a few more about a mile south-west of the first grove. They are widely scattered, and in a dense forest of Firs and Douglas Spruce, and taller than those on the Siskiyou Mountains, but have a smaller trunk diameter. We spent two days collecting the seedlings. Mr. Orrin Russell informed me that he knew of about a dozen trees at the head of Sucker Creek, in the Siskiyous, which I would have visited had I not been prevented by heavy snow.

Larkspur, Cal. *Thomas H. Douglas.*

North Carolina Notes.

A WEEK ago I visited Fayetteville, the head of navigation on the Cape Fear River. I have been raising a great number of Tea-plants, and had selected the neighborhood of Fayetteville as a favorable location for a subexperiment station for a Tea-plantation. The place lies in the upper Long-leaf Pine belt, where a slightly undulating section of sandy loam, underlaid with granitic clay, makes a warm soil, which seems peculiarly adapted to tree-growth. There is here an old neglected Tea-plantation, from which good tea has been made for many years. The fact that the plants have survived in a dense thicket of Pine, scrub Oak, Briers and Smilax shows their hardiness, and they seem to be getting almost naturalized; at all events, there are multitudes of young seedlings in the woods about the old plantation. At the time of our visit these plants were full of flowers, but the white petals were browned by the recent frost, though many buds still remained to continue the bloom.

On this old place we found a noble avenue, the trees in which were alternately evergreen Magnolias and Prunus Caroliniana. I have always regarded this last more as a large tree-like shrub than a tree proper. But here they stood almost as large as the old-fashioned Cherry-trees we used to plant in avenues in Maryland, some with trunks eighteen inches in diameter. The Magnolias were of like massive proportions. Nearer the old mansion the land broke into swelling undulations as it sloped toward the river, and here, with admirable taste, has been preserved a large area of the original forest-growth of the Long-leaf Pine. Never in all my experience have I seen a finer growth of this majestic tree, and the crop of seed this year is so plentiful that the ground was fairly covered with the dropping seeds. It may be many years before another such crop is made, for the Long-leaf Pine is rather shy in fruiting. Here, too, on the lawn, were great plants of Gardenia florida, with their latest flowers just crisped by the frost, but with glossy foliage untouched, testifying by their massive growth to the generous soil and hospitable climate.

When my business was over I spent a day looking about the old town for objects of horticultural interest. In one door-yard, and only one, I saw Olea (Osmanthus) fragrans of fine size, from whose sweet blossoms the frost had not quite driven the perfume. In this same door-yard Magnolia furcata did not look altogether happy. Just across the street an old mansion had burned down the day before, and I wandered in the grounds, crowded with many interesting plants. Close by the still smoking ruins, two plants of Camellia, to match formerly fine pyramids, now stood scorched and blackened, while the great Indian Azaleas, that stood by the portico, were evidently killed by the fire. Near by a Cryptomeria, nearly fifty feet high, was completely covered by a giant plant of Eleagnus reflexa. Out of danger from the fire stood the largest Cork Oak I have ever seen, though there is a larger one at Avoca, on Albemarle Sound, from which I have had acorns sent me this season. The Fayetteville people are evidently flower-lovers, for almost every door-yard has its little glass-covered pit for wintering over the pet Geraniums and Callas. The Oleanders kept company with the Gardenias outside, in many places sheltered by dense and closely trimmed hedges of Japan Evonymus. As in most other places, far-fetched things seem to be most valued, if I except the ever-present Laurel Cherry and Magnolia. In one place only I saw some plants of the beautiful Ilex vomitoria. One of these was loaded with its brilliant scarlet berries, looking as translucent as glass beads. I am exceedingly sorry it seems necessary to go back to the name "vomitoria" for this beautiful shrub, Cassine was so much more pleasant. The common name here is "Yaupon," probably the old Indian name. The pretty Laurel Cherry, Prunus Caroliniana, is here called Mock Orange. Osmanthus Americana, the American Olive, one of the handsomest shrubs of our coast, I did not find cultivated anywhere.

The front yards were pleasant, and I strolled around the back streets to peep at the vegetable gardens. Alas, what a poor appreciation people have of their climate. Not a vegetable did I see, except some unhappy, worm-eaten Collards on stalks two or three feet high, and a few Turnips. No Lettuce, no Radishes, no Kale, no Spinach; no cold frames for heading Lettuce free from frost-marks. And yet, in this warm, sandy soil and genial sunshine, these hardy vegetables would be just in their element now. But the Fayetteville gardens showed fewer vegetables than the snow-buried gardens of the north. In my own garden in the colder clay soil of Raleigh there is not a day all winter in which we do not have fresh vegetables from the garden, and here, in a warmer soil and seventy-five miles further south, not a green thing could be seen in the kitchen gardens but that gaunt burlesque of a Cabbage, called the Collard. Only a few days before, I had dug my late crop of Irish potatoes, grown since August, and here was a thriving town living on northern potatoes at $1.50 a bushel, with stalks of the "roasting-ear" corn still standing in the gardens since the June crop was eaten.

Raleigh, N. C. *W. F. Massey.*

New or Little-known Plants.

A Double Morning Glory.

IN our issue of October 5th, page 480, we spoke of having received from Mr. Curtis A. Perry, of Braintree, Massachusetts, specimens of a double-flowered Morning Glory, Ipomœa purpurea, or, at least, of a plant apparently identical with Ipomœa purpurea in all its characters except the corolla; the calyx, which is also sometimes doubled, being especially well marked by its shape and pubescence. The leaves were almost as large as those of Aristolochia Sipho, and the flowers, which were very much doubled, were a blush white and streaked with light purple. Photographs of the plant showed that it was rampant in growth and profuse in bloom, the flowers standing out boldly beyond the leaves. The seed first came from Mexico three years ago, and the seeds from the plants then grown have produced plants in which for three years the flowers have come true to their double character. The plants begin to bloom out-of-doors in September, but one of them, when cut back last autumn, flourished well as a pot-plant in an ordinary furnace-heated house.

After these notes were published, Mr. Sylvester Baxter, of Boston, wrote us that he was with Mr. Perry, visiting the little tropical city of Cuautla, when they first observed among other plants a strange-looking flower on a vine which was romping over the corridor of the second story of the hotel where they were stopping, and, from time to time, gathered seeds as they ripened. The first year both Mr. Perry and Mr. Baxter raised plants, which bloomed abundantly. The plants flower much later than the single variety, even when growing side by side with it under the same conditions, so that it is difficult to obtain mature seed from outdoor plants before autumn frosts cut

them down. This year they were covered with flowers early in September, and they still presented a good appearance when Mr. Baxter wrote in the middle of October. As to the general appearance of the flower, he writes that the "numerous petals standing somewhat apart form a light little cluster of striking delicacy, which gives the flower a fluttering or bird-like aspect."

Mr. Faxon's drawing, reproduced on this page, very well shows its characters.

In Dr. Masters' *Vegetable Teratology* it is noted that dialysis has been observed in Pharbitis as well as Convolvulus, Pharbitis being now included in Ipomœa and in the section of the genus to which Ipomœa purpurea belongs. It is more proper, however, to call this doubling or

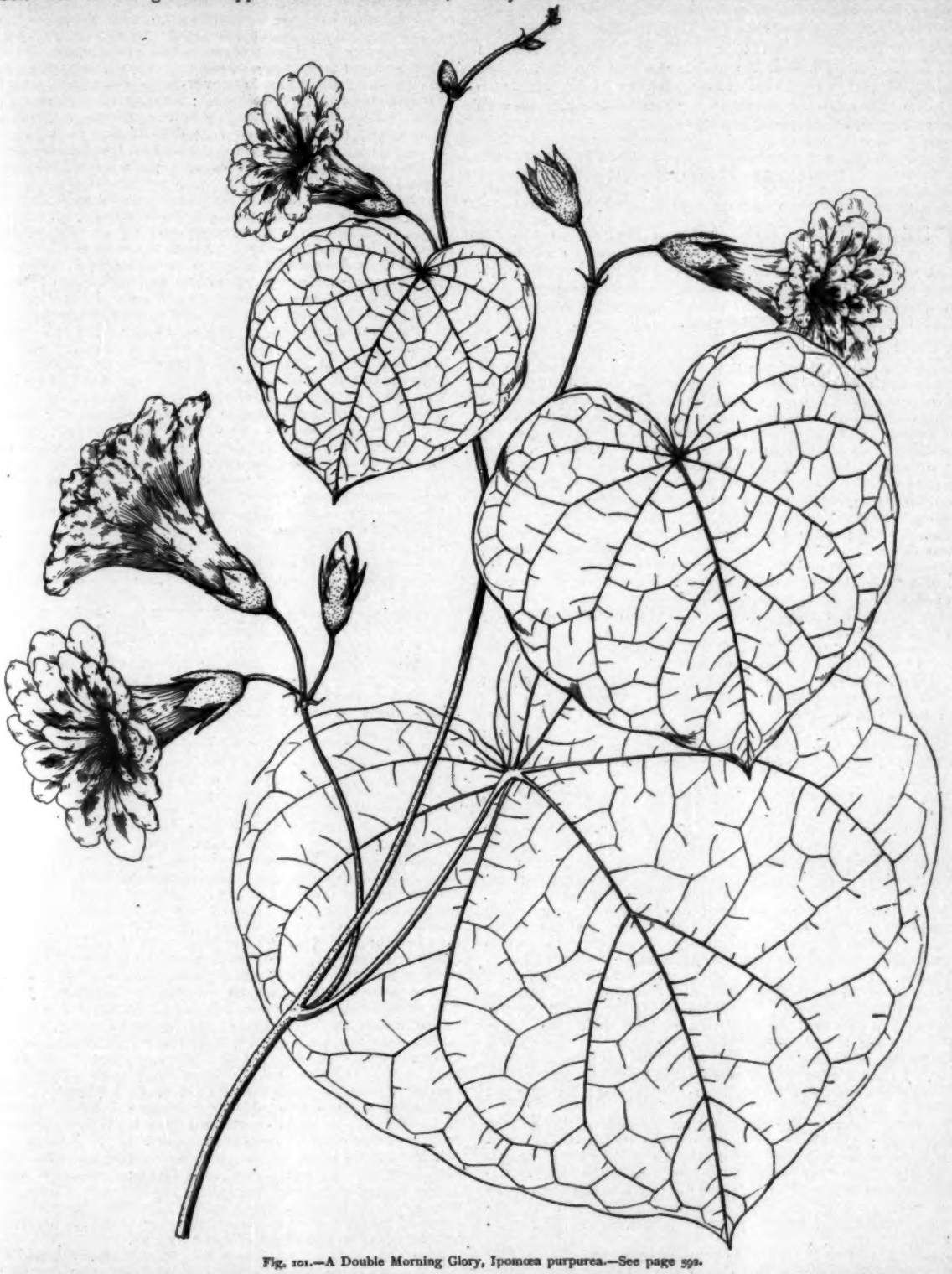

Fig. 101.—A Double Morning Glory, Ipomœa purpurea.—See page 592.

multiplication of the parts of the corolla a case of pleiotaxy. Dialysis is merely the separation between parts primarily undivided, as when an ordinary gamopetalous corolla is divided into five distinct petals. Examples of pleiotaxy among Polypetalæ, such as Roses, Pinks and Anemones, are very familiar, and among Gamopetalæ it has been noted in Datura, Campanula, Primula, Arbutus, Nerium and Gardenia. Dr. Masters makes no mention that it has been observed in Ipomœa, or any member of the family, so that this plant has exceptional interest botanically as well as on account of its horticultural value.

Cultural Department.

How to Grow Cyclamens.

THE Massachusetts Horticultural Society, in making its awards last year, gave a premium to Dr. G. C. Weld, of Brookline, for the successful cultivation of Cyclamens, and the Committee on Gardens, in their report, publish a paper by Mr. Kenneth Finlayson, Dr. Weld's gardener, in which his method of growing these flowers is explained, and which we now reproduce:

I sow the seeds about the 1st of December in a compost of fibrous loam and well-decayed leaf-mold, in equal parts, adding thereto a liberal dash of sharp, clear sand, with a further quantity of finely crushed charcoal to keep the whole porous and sweet. The top layer of soil in which the seeds are immediately sown is more sandy and more finely sifted than the rest of the earth. Ordinary earthen seed-pans are used for this purpose, the size depending on the quantity of seed to be sown, an eight-inch pan being sufficiently large to contain two packages of seeds such as we buy from seedsmen. Good drainage in the bottom of the pan must not be neglected. When the seeds are sown and watered well with a fine rose, the pans are placed in sphagnum moss in a mild propagating-bed of a temperature of sixty degrees. I cover the pans with a pane of glass to check evaporation, and thereby avoid the necessity of frequent watering, which ought to be particularly guarded against.

In this temperature, named above, the seeds will germinate in from four to six weeks. After they have formed a leaf they are taken into less warm quarters, and near the glass, but shaded from the bright sunlight for some time. When they have made two or three leaves I transplant them into boxes, using compost much the same as at first, but less sandy, keeping them all the while close to the glass at this period of their existence, in order to have a sturdy and stocky foundation to build on.

They are put out into cold frames early in summer, but still kept in boxes, guarded against cold draughts and sudden changes in the weather, until they get sufficiently hardened to stand some little rough usage. I syringe them morning and evening in hot dry weather, and shade them only from the fierce noonday sun, using lath shades for the purpose; the sash is removed entirely at night when the weather is favorable.

About the 1st of June I pot them into three-inch pots, using at this potting a little well-decayed cow-manure, though sheep-manure is preferable in this compost. They are returned to the frames again, and the pots are plunged up to their rims in coal-ashes. They must be carefully watered for weeks after this operation, and syringing overhead morning and evening must be steadily adhered to. With this treatment diligently persevered in they will be ready for another shift into larger pots about the 1st of September or sooner. At this shift a five-inch pot is chiefly used, this being the pot in which they flower. In a few exceptional cases there may be some plants that outgrow the others to such an extent that a six-inch pot may not be any too large.

The earth used in the final potting consists of three-fifths fibrous loam; the other two-fifths consist of leaf-mold, cow-manure or sheep-manure, and sand, the leaf-mold predominating. Particular care should be exercised when potting the Cyclamen that one-half at least of the bulb be left above the potting-soil, for it is from the top surface of the bulb that the flowers proceed, and if this is placed under the earth the flower-buds will surely rot.

I keep them in their quarters in the frames until the middle of October, before taking them into the greenhouse. After they are brought into the greenhouse they have as light and airy a position as possible. I keep them on the front bench of my Pink-house, in which place they do admirably well, the temperature at which this house is kept, namely, from fifty to fifty-five degrees, being, in my opinion, the ideal Cyclamen temperature. Indeed, fifty degrees is quite high enough; if kept steadily at that point the plants will be more healthy, and give more and finer-colored flowers.

They begin flowering sparingly eleven months from the date of sowing, but will not come into full flower until thirteen months from that time. I commence stimulating when they begin to form their flower-buds, or sooner should the pots be well crowded with roots, my never-failing stimulant being Peruvian guano, or its best imitation; also, soot and guano in equal parts, mixing them thoroughly before using. A small handful of any of the above fertilizers, dissolved in a six-gallon can full of water, is used once a week should the weather be clear, so that they demand much watering; otherwise, the watering is less frequent.

Cyclamens thus treated will continue to flower until late spring or early summer, when they will show signs of a want of rest; this rest must be brought about gradually, and should never be too severe—that is, never so severe that they will lose all their roots and foliage. Old plants are turned out of the pots some time in June, all the soil is shaken from their roots, and they are then planted in frames, giving them a thorough watering, to settle the soil about them. Afterward a nice layer of short grass is laid over all to keep the soil cool and moist.

I also shade the glass with a heavy coat of paint, and keep the sashes at all times raised at both ends four or five inches, to secure a current of air over them continually. All this done, there is no further attention necessary except a watering at long intervals, until they show some signs of activity, which will be about the beginning of August, when the grass covering should be removed, in order that the young leaves which will now start will have a chance to develop. The soil from this date is kept more moist.

In the third week of August they are repotted and treated like the younger plants—that is, they are plunged in ashes and syringed overhead twice a day if the weather demands. Under such treatment I get flowers as good in every particular from old plants as I do from younger ones, and a great many more of them.

Diseases of the Carnation.

THE enemies of the Carnation are numerous. There is, for example, the rust (Uromyces caryophyllinus, Schr.) that has already ruined many beds and many more are doomed. This fungus works in a very obscure manner until it has undermined the constitution of the plant and then it shows itself in great brown dusty patches upon leaf and stem. It is a genuine rust and is closely related to the forms upon grass and grain. Its habits are such that to stamp it out requires the heroic treatment of fire. Spraying may prevent its spread to healthy plants, but nothing can be put on an attacked plant that will rout the deeply seated enemy. A recent letter from Nebraska reported it in that state.

But while this rust is a bad enemy it is not the only one. It gets the credit due to other foes. When samples are sent to the station the first question is this: "Is this the rust?" And more often it is not the rust. One of the most common Carnation troubles is what may be called the leaf-spot. This is caused by a fungus that is somewhat local in its work, at least may be confined to one small spot while all other parts of the plant are entirely healthy. As a rule, however, a plant that is attacked in one place will be a victim elsewhere. These spots are at first somewhat swollen or thickened patches which soon become brown or even almost brick-red in color, and later, dotted with blackish specks, which are the places where the spores are produced and ooze out when mature and the surface is wet. By means of these multitudes of spores the fungus is able to spread rapidly through a house if affected plants are permitted to remain untreated. From the nature of this trouble it is quite evident that it is amenable to the ordinary treatment for fungus parasites.

Last winter a large grower of Carnations volunteered to treat his plants affected with blight as follows: One-half of a large house was sprayed each week with a solution of a half-ounce of sulphide of potassium to a gallon of water. He was so well satisfied that he soon extended the use to all his houses and felt the remedy was of great value to him.

Another Carnation trouble is an anthracnose, and, while this is bad upon large plants, it is the most destructive to cuttings. This colletotrichum appears upon the surface of the stems and bases of the leaves as small black specks which, under the microscope, are made up of spores and dark stiff hairs. It is

fond of moisture and is usually located near the base of the plant, but its threads reach throughout an affected plant. When cuttings of a diseased plant are placed in the sand the new conditions of additional moisture favor the fungus, and soon the stem softens at the base and the black specks appear upon the surface of the decaying tissue. Shortly the cutting has rotted off. It is, therefore, very important to use healthy stock for the cutting-bed. This is sometimes illustrated in the propagating-bed when all cuttings from certain plants fail while others from neighboring stock do not.

The last trouble to be here mentioned differs very much from all those above given. The affected plant shows no rust-patches, no colored spots of the Septoria or black speck of the colletorichum species. The whole plant is sick, fails to grow and bloom, and the leaves have a shriveled or somewhat wrinkled appearance, with peculiar minute ashy or yellowish markings, as if something had scratched the leaf internally. There is no sign of any insect at work and no filamentous fungus. Bacteria swarm in the faded streaks, but they may follow and not precede the disorder; it may be that the trouble is at the root. Persons in sending specimens that answer to the above-attempted description should include the root.

Rutgers College. *Byron D. Halsted.*

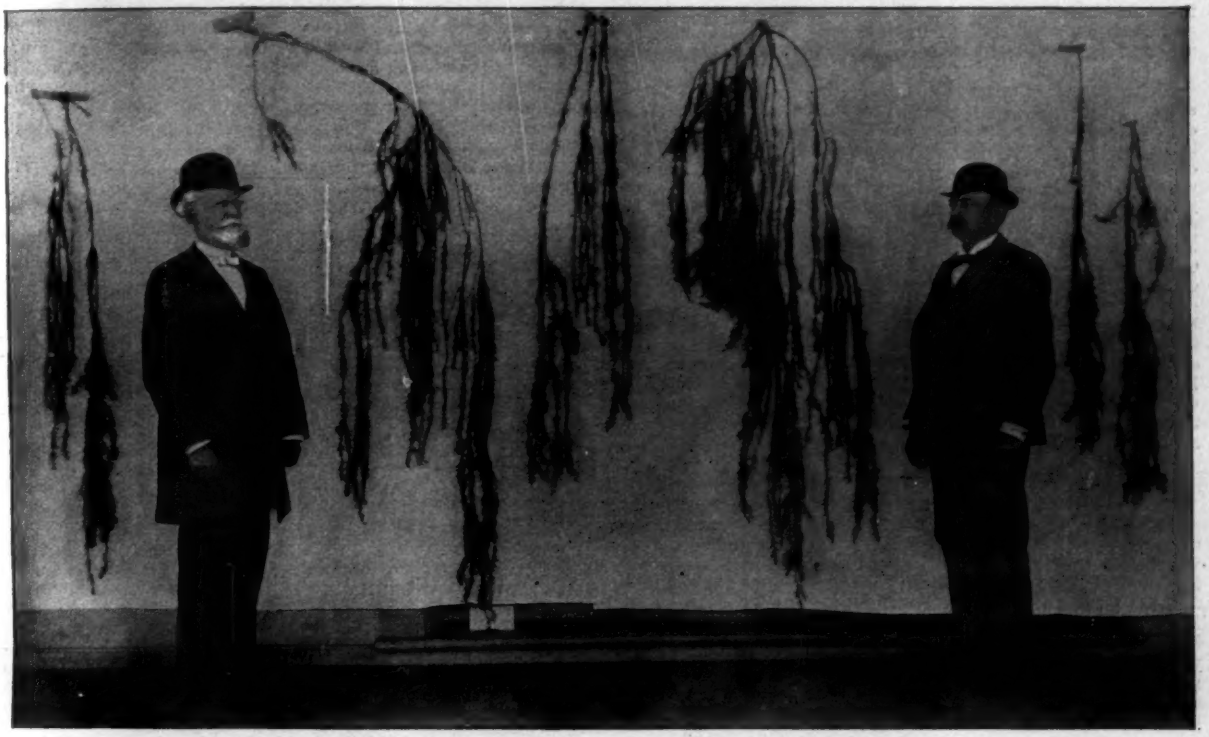

Fig. 102.—Branchlets of the Weeping Spruce (Picea Breweriana).—See page 591

Late Chrysanthemums.

WHEN the Chrysanthemum exhibitions are over there seems to be a general feeling that the season has gone by. What few remain must be varieties with special qualities to commend them. So late in the season it is hard to endure any but the best, and little attention has been given to late varieties by raisers.

Ethel is a white-flowered, straight-petaled Japanese sort; good either for specimens or cut blooms, and it comes into bloom about Thanksgiving. If kept cool, many flowers will hold until Christmas. Mrs. H. J. Jones is a yellow sport from Ethel, and identical in every particular except the color of its blooms.

C. B. Whitnall, one of last year's introductions, is a Japanese incurved kind of great merit. It certainly is the best late variety of its color, which is a deep claret, with silver-lake reverse. Its habit is all that can be desired, either for bush specimens or cut blooms.

Mrs. Isaac Price very much resembles the old Golden Dragon, except that its flowers are sulphur-yellow. It makes a very handsome low-growing specimen. For the reason that its hooked and twisted petals interlock, it is useless for shipping, either as specimens or cut flowers. Its cut blooms do not associate with other varieties, or even in groups by themselves, but singly in glass bottles or small vases they are superb.

O. P. Bassett is another variety introduced last season, and generally condemned because of its lateness. A friend of mine speaking of it says the color is precisely that of the famous G. W. Childs, deep velvety crimson, while its blooms are equal to that variety in size, and superior in form, being quite double. Whether or not it will make a good bush specimen I am unable to say.

Syringa has always been too late for the exhibitions here. Once it had many admirers; now it is nearly forgotten on account of its lateness. It is an excellent kind for cutting, making large, elegantly incurved, flesh-pink blooms. Molly Bawn is a pure white sport from it, and among the handsomest of the late white bloomers.

Gold-finder has never bloomed in time to exhibit. The blooms are of an uncommon type. Their chief beauty lies in the infolding of the florets with age. A handsome yellow one of this type, named Gloriana, was exhibited by Mr. J. V. May at the late Madison Square Exhibition. White Cap, a recent importation of Halleck's, is another late variety having the same peculiar character of bloom. This year has added some pink and violet colored ones to the list which will be sure to come into favor.

Mrs. Humphreys I consider the best late white for any purpose. It makes a handsome specimen. The blooms are supported on good stiff stems. The florets are stiff, close and straight, fitting it especially for shipment. It is, moreover, sweet-scented. Marvel created quite a sensation a few years ago when introduced by John Thorpe. The blooms are particolored, the outer florets being white, centre bright pink, making a striking contrast. It grows into a cheerful-looking specimen, and very few visitors pass it by without some complimentary remarks. Marvel is seldom seen now, mainly from the fact, I suppose, of its being late. We only once had it in time for exhibition.

Wellesley, Mass. *T. D. H.*

The Chrysanthemum is so universally popular in its regular season of blooming—that is, through October and early November—that it has practically displaced the Rose in those two months, and we now have the Queen of Autumn usurping for a short season the place of prominence which has been held for centuries by the Queen of Flowers. Commercial growers are always alert to supply every new want and cater to every change of public taste, and they have, therefore, endeavored to prolong the season of a flower which has been so generally admired. Efforts to force it into perfection before its natural season have been made throughout the country until the attempts to grow early Chrysanthemums are well-nigh exhausted. The late season still remains, and I, with others, have labored hard for eight or ten years to extend the blooming season in that direction. My efforts have met with considerable success, because some of the very latest varieties now in use are seedlings of mine; and yet I sometimes question whether this effort to prolong the Chrysanthemum season beyond its natural limits is wise or profitable. At least, I have never been able to sell as many plants or flowers of exceptionally early or late varieties as of those which are at their best in the mid-season. People seem to grow weary even of beauty when it is overabundant; nevertheless, I will name a few of the late varieties which, in my estimation, are among the best:

Mont Blanc is a large white incurved flower which shows an eye. Its blooming season is from late November till the middle of December. Another good white flower is Flora Hill, a large reflexed variety, which blooms from the middle to the end of November. Mrs. John Westcott is another reflexed white of the same season. John Lane is a soft pink incurved flower which also blooms in late November. The finest late pink in cultivation, however, is Mrs. Charles Dissell, a very large incurved flower, which is good from late November to Christmas. Gold is a deep yellow reflexed flower, which is good during the first half of December, but the best bright yellow of all late-blooming Chrysanthemums, and one of the very best Chrysanthemums of any color is Miss Eva Hoyt, a large incurved flower, which blooms in late November and into December. The latest of all, and a very good one, too, is Mrs. H. A. Pennock, a large incurved bronze-yellow, which commences to flower about the 1st of December and lasts quite through the month. Indeed, it might be called a New Year's flower.

Philadelphia, Pa. *W. K. Harris.*

We have found in Philadelphia that Mont Blanc, although not quite up to the exhibition standard, is a first-rate variety, and its natural tendency to come late makes it exceedingly valuable, and the same is true of its lemon-colored sport, identical with it except in color. Gold, which is also known as Mrs. R. Elliott, we have also found good for late work. Potter Palmer, one of the more recent introductions, is an admirable late white, and so is Pelican. Dr. Covert, one of last year's introductions, promises well for late use. It is very large, incurved quite double, and the yellow of its florets is streaked with red. Flora Hill and Mrs. John Westcott are both inclined to be late, and the first-named is one of the very best of keepers we have. In extending the Chrysanthemum season, that is, to secure early Chrysanthemums as well as late ones, there is a great deal in management, and some flowers can be hurried and others held back by one who knows how to select and how to manage them.

Chestnut Hill, Philadelphia. *Edwin Lonsdale.*

Orchid Notes.

Zygopetalum intermedium is considered by many Orchid-growers a variety of the well-known Z. Mackayi, the only difference being that the lip of one is glabrous and that of the other pubescent. The flowers, averaging six in number, are arranged alternately on the upper portion of the erect stem, and are about three inches in diameter. They appear during the winter months, and last some six weeks in full beauty. They are quite fragrant—a fact seldom noticed by writers, and one of some importance to those who might grow the plant in order to cut the flowers for decorative purposes. They are well adapted to this use, as they all expand about the same time and last in water nearly as long as upon the plant. The sepals and petals are oblong, green, richly marked with brown, and spreading in the form of a semicircle; the protruding white lip is rather more than an inch and a half in diameter, the entire upper surface being beautifully marked with purplish blue. Flowering profusely, and easy to grow, the plant must certainly be classed among the most useful of the Orchid family. It should be grown in a well-drained pot or pan, using good fibrous peat for the roots. The peat may be lightly surfaced with sphagnum, to preserve the roots in the moist, not saturated, condition, which is always desirable.

Platyclinis Cobbiana is a pretty little Orchid now flowering freely. It is not showy, but its long arching racemes have few rivals in gracefulness. The slender raceme proceeds from the top of the pseudo-bulb, and is about eighteen inches in length, the terminal half supporting from forty to fifty flowers, each nearly half an inch across. They are of whitish color, with conspicuous bright orange lip. P. Cobbiana, like the other three species of the same genus which are in cultivation, is a native of the Philippine Islands, whence it was introduced in 1879. No two of the species known in gardens flower at exactly the same time, and thus one is seldom without flowers on some one of the plants where all are included in a collection. P. uncata closely succeeds P. Cobbiana, and is followed in spring by P. glumacea, while P. filiformis (figured in Garden and Forest, vol. ii., p. 485, under the name of Dendrochilum filiforme) blooms in early summer. The last two are especially elegant plants, and the flowers of P. glumacea are delightfully odorous. They all grow luxuriantly in a stove, and should be potted in peat and sphagnum, with good drainage, soon after flowering. The roots should always be moderately moist; but when the plants are growing vigorously, the supply of water should be liberal. The name Dendrochilum, which is frequently used in connection with these plants, belongs more correctly to an allied genus.

Cambridge, Mass. *M. Barker.*

House-plants for Shady Windows.

In the effort to establish a window-garden various disadvantages are encountered, not the least of which is found in adapting to this purpose a window which enjoys little or no sunshine, although such windows are sometimes the only available ones. This naturally makes the selection of the plants more difficult than where all the advantages of full sunlight are enjoyed, but still it need not discourage the window-gardener, for a very pretty mass of greenery, as well as some flowers, can be grown, even under these conditions.

As might be expected, foliage-plants will occupy a prominent place in a window arrangement so situated, and at the head of the list of suitable subjects should be placed the Aspidistras, plants which possess such vitality that sunlight seems a secondary consideration. Either of the varieties of Aspidistra will be found satisfactory, though A. elatior and its variegated form are the best, the latter being generally more dwarf in habit than the type, and, like it, in needing repotting only at long intervals. The Begonias, also, are shade-loving subjects, and the beauty of foliage and flower combined in this extensive genus gives considerable variety from which to choose for the window-garden. The Rex Begonias are invaluable for this purpose, their massive many-tinted leaves adding much to the effect, and B. metallica is also excellent, being a strong and rapid grower, and pretty both in foliage and flower. B. nitida is another handsome, strong-growing species with large glossy green leaves and panicles of rose-colored flowers, while B. rubra makes an admirable companion plant for the above, its flowers being very large and bright red. If still more variety is needed among the Begonias, we may add B. Saundersii, B. semperflorens and B. manicata, for, though the latter sort is a cropper in blooming, yet it is so graceful and pretty when in flower as to be a general favorite.

Calathea zebrina can also be safely recommended for a shady window, though it should be borne in mind that this plant will not thrive if allowed to get very dry, nor in a room in which the temperature falls below fifty-eight or sixty degrees at night. A nicely berried plant of Ardisia crenulata will do much to brighten the window-garden, its glossy leaves and bright red berries reminding one of Holly, without the prickles. It is advisable, however, in getting plants of Ardisia that they should be not less than five-inch-pot size, as they seldom bear berries before that size, and it should also be remembered that they cannot endure defective drainage and stagnant moisture at the root.

Fatsia Japonica, or Aralia Sieboldii, is another good subject for the window, and will flourish in spite of draughts and lack of sunshine, its large deeply lobed leaves of dark green being very ornamental, and, for variety, one or more of the variegated forms may be added, though these may not prove to be quite so hardy as the type. Clivea miniata is another excellent house-plant, its strap-shaped leaves being evergreen, and the strong spikes of orange-flowers will appear at indefinite times

throughout the year. This plant is very easily grown, and requires no more care than an Agapanthus, though it is rather more tender than the latter, and, like most of the Amaryllids, needs a certain degree of rest previous to flowering, but not absolute drying off.

The Bow-string Hemp (Sanseviera Zeylanica) is also a plant of accommodating habits, and will flourish in the shade, while the dust and dry air of a living-room seems to have but little effect on it. It has long, narrow, erect leaves, the ground color of which is dark green, curiously mottled with grayish white.

The dwarf Papyrus (Cyperus alternifolius), and also its variegated variety, may be used with good effect, the most essential point in their culture being an abundant supply of water.

Peperomia maculosa is a pretty little plant with thick fleshy leaves that are marked with silvery variegation, and should be grown in small pots or pans with an abundance of drainage material, since it is essential to the welfare of this plant that it should not be overwatered, especially during the winter.

Some Palms may be used for a sunless window, for, while most of them are improved by a measure of sunshine, yet it is not absolutely essential for all, and among those best adapted for the present purpose are Kentia Forsteriana, K. Belmoreana, Rhapis flabelliformis and Livistona Chinensis, all of which will flourish with reasonable care. From the Ferns a number can readily be selected, those having fronds of firm texture being most reliable for household use, among these being Polystichium acrosticoides, Pteris serrulata, Nephrolepis exaltata, Pteris Cretica and some of the Maidenhairs, Adiantum Capillus-Veneris and A. cuneatum being probably the most reliable of these.

For carpeting the surface of the soil in some of the larger pots Selaginella Kraussiana is useful, and makes a very pretty covering in a short time, and seems to enjoy the shade. The Variegated Periwinkle (Vinca variegata) may be put to good use in draping the plant-stand, for, while this handsome vine grows vigorously in the full sun, yet it may also be grown in the shade to entire satisfaction. All the plants thus briefly noted may be grown in any reasonably good loam, and, with proper care in watering, will make themselves thoroughly happy and at home.

Holmesburg, Pa. *W. H. Taplin.*

Notes from the Harvard Botanic Gardens.

CURCUMA ROSCOEANA.—This interesting and highly decorative plant is a tuberous-rooted stove-herb, sending up in spring several elegant arching leaves with slender sheathing petioles from eighteen to twenty-four inches long, and oblong-oval blades of pale green color two-thirds the length of the petioles. The scape, twelve inches high, appears in summer, and the upper portion is a dense mass of concave, rich orange-scarlet bracts. The flowers are tubular, with two spreading lips about three inches in length and of light yellow color. They are produced singly at the base of the curved bracts, which enclose the lower part, leaving only the limb visible. The bracts retain their brilliant color for several months, but the flowers soon fade, though they are repeatedly replaced. C. Roscoeana is found on the coast of Tenasserim, in the East Indies, whence it was introduced in 1837. A moderately high temperature is necessary to its satisfactory development, and it seems partial to slight shade; the color of the bracts, at least, is longer preserved when the plant is grown in a shady position. It requires to be kept quite dry in winter, and the roots should be shaken free of the soil in spring and repotted firmly. A free supply of water is essential until the leaves begin to turn yellow, when it may be gradually discontinued. The roots are easily divided, and the plant is readily propagated by that process.

EUCHARIS GRANDIFLORA.—This plant, better known, perhaps, as E. Amazonica, or the Amazon Lily, is an old tenant of our stoves, but it is none too common nowadays. The mite (Rhizoglyphus echinopus), which worked such havoc among the bulbs a few years ago, influenced many in parting with the plant, and deterred others from beginning its cultivation. Little complaint is now made of the insect, and the plant should be restored to favor. The pure white, drooping flowers, of heavy substance and four inches in diameter, are borne in large clusters at the top of erect scapes two feet high. It is seldom that more than two or three blooms are fully developed on a single scape at the same time; but they open in such constant succession, and the scapes are produced in such profusion, that the plants form most pleasing objects for weeks together. There is nothing more effective than the contrast between the luxuriant leaves and chaste flowers of this plant, and the flowers have the further advantage of an extremely grateful odor. They are produced at various seasons, more abundantly in winter than at any other time, and the plant delights in moderate activity throughout the year. It should be grown in large pots or pans, placing a quantity of the bulbs four inches apart in each, and the soil should consist of rich turfy loam, fibrous peat and thoroughly decomposed cow-manure in equal parts, adding a small amount of lumpy charcoal. Perfect drainage is of primary importance, for the Eucharis requires a large supply of water, and frequent repotting is not advisable unless the plants are in poor health. They may be safely expected to bloom every three months, and for a fortnight before the buds expand, manure water may be administered every other day.

Cambridge, Mass. *M. Barker.*

Correspondence.

Fructification of the Grape.

To the Editor of GARDEN AND FOREST:

Sir,—Many of our varieties of Grapes occasionally bear defective clusters; some of the berries remain green, and not larger than bird-shot, throughout the season, while other grapes of the same bunch grow to full size and maturity. This imperfect ripening has been ascribed to deficiency of pollen, and it is advised to plant in the vineyard a few pollen-bearers—"male vines"—to provide for this deficient element of fructification. By many viticulturists this abortion of fruit is accounted for by "the reflexed stamens" in certain sorts of Grapes, these organs bending outward and downward away from the pistil, and thus failing to impregnate the stigma.

These explanations seem plausible, but further notice of this imperfect fructification makes me question their soundness. The reflexed stamen is natural to the Riparia Grape and to its relatives. The more frequent examples of this defective fruitage may be seen in the pure Riparias, yet even here there are exceptions, notably in the Clinton, which with me forms perfect clusters. The Concord Grape (a Labrusca with erect stamens) never shows this imperfect fruitage. On the contrary, the Ives (also Labrusca, with erect stamens) is often thus afflicted. The crop of Ives in 1890 was characterized by numbers of these aborted grapes, while in an enormous fruitage of the Ives in 1892 all of its berries developed to full maturity.

In capriciousness of fructification, however, the Iron-clad Grape is especially puzzling. It is a natural hybrid between V. Riparia and V. Labrusca, with reflexed stamens. Soon after I first fruited this Grape, in 1876, I exhibited samples of it at the Centennial Exposition. Each lateral then bore five or six perfect clusters, the berries all fully formed and matured. The vines bearing this fruit were nearly as densely crowded with clusters in autumn as they were with foliage in summer. They were planted in a block of a thousand vines, all the one variety, set six by nine feet apart. Their wood-growth was rampant, single stocks making in one season several canes each from twenty to thirty feet long, with luxuriant lateral branches. Pruned in the same manner as were the Concord and Ives, on the so-called renewal system, that is, with two canes, with six buds on each, these Iron-clad vines as they grew older began to set imperfect clusters, and in a few years it was difficult to find half a dozen fully developed berries on a cluster, all the rest being little green abortions, clinging to the stem, and thus remaining throughout the season. I then left one row of these vines unpruned; these fruited full of nearly perfect clusters, while the vines in the pruned rows gave the usual defective bunches.

In close vineyard culture this non-pruning method is hardly practicable, and I tried the plan of letting a few vines run along the trellis as far as they might grow, their laterals being spurred to one bud. Near the extremities of these long canes the clusters were full and perfect, while near the stock they were made up of chiefly aborted berries. As the reflexed stamen is a constant character of this variety, if such stamens are the cause of abortive berries, this defect should have been seen in all the clusters.

The behavior of the Ives Vine in this respect is also perplexing; having erect stamens, why should it sometimes bear imperfect scraggy clusters? The evidence apparently contradicts the theory. Years ago, to test the Iron-clad's ability to resist the black-rot, I planted many of these vines along a trellis intermediately with Concords, the vines of both sorts intermixing on the wire. Growing thus the Iron-clad annually fruits bountifully, with perfect clusters. It might be argued that here the Iron-clad blossoms are impregnated by pollen from those of the Concord; but, unluckily for the force of this reasoning, the blossoming of the Iron-clad is over, and its fruit

is formed before the Concord flowers are opened. There is an interval of ten days between the blossoming of the two. It is certainly remarkable that the only old Iron-clad vines on my farm which bear annually full crops of perfect bunches are those growing interspersed with vines of Concord and of Ives. Remarkable, too, that the same is true of those which are left to grow without pruning. I have planted Iron-clad vines at the foot of each Apple-tree in my orchard, letting them climb as they will through the tree-branches. Thus growing they fruit perfectly, in spite of the reflexed stamens. We know that pollenization is essential to fructification, but it is by no means certain that all Grape-blossoms which have both stamens and pistils may not always be competent to their own impregnation, notwithstanding the reflexed form of the stamens. These organs are not reflexed until the cap is shed from the blossom. I am assured by an eminent botanist that "the Grape stigma is certainly pollenized from its stamens before the cap falls from the flower." Hence the theory that pollen-bearing vines, male vines especially, should be planted in the vineyard to aid fructification seems unsound. For some fifteen years I have practiced on this theory, growing pollen-bearing vines scattered through my vineyards, yet I have never seen results from so doing which might not be as well ascribed to other causes. I suspect that a full fructification of the Grape-vine is greatly dependent on the nutrition of the plant, on accidents of the season and on the sterilizing influence of sundry fungus germs. Since I have been making experiments in vegetable pathology I think I have seen a marked benefit to fructification by spraying the vine when in full bloom with the Bordeaux mixture.

It has been suggested that for the development of the pulpy or edible part of the fruit the normal development of the seed is essential, and that, therefore, elements of plant-food which largely contribute to the growth of the seed, notably phosphoric acid and potash, should be supplied. It is true that the portion of my vineyard where the fruiting of the grapes with reflexed stamens was heaviest had been heavily treated with superphosphate of lime. Against the plausibility of this theory stands the fact that good seedless apples and pears and other fruits are not rare.

The sum of the matter is that the process of fertilization is not yet fully comprehended, and that we are still far from a scientific solution of many of nature's mysteries.

Vineland, N. J. *Alex. W. Pearson.*

Roses in California Without Irrigation.

To the Editor of Garden and Forest:

Sir,—Two young ladies of Oakland, who conduct a Rose-nursery here, grow their stock from cuttings of mature wood taken in the latter part of autumn or in winter; these are put as soon as possible into nursery-rows where they are to grow. The rows are far enough apart to admit of cultivation with a horse. It so happened last winter that the cuttings could not be planted until well into February. For the most part they rooted well, and at once commenced a vigorous growth. In May the plants of La France, of which a large stock was put in, commenced to bloom just one month later than the plants from which the cuttings were taken. They have bloomed continuously ever since, yielding an almost incredible number of good commercial flowers. Duchesse de Brabant and Papa Gontier follow pretty closely after La France in floriferousness, but up to the present time no other kind equals La France. It is remarkable that from May to the middle of October these plants grew and bloomed without irrigation or rain. This statement seems almost incredible, even to Californians, but it is entirely true, nevertheless. The climbing sorts have made, in many instances, a growth of five and six feet. A row of Claire Carnots, another of Estella Pradels, and still another of Madame Alfred Carrières have sent up shoots the size of one's finger, and in the early part of November they were blooming quite freely. Perhaps 200 other sorts are doing equally well after the habit of each. Of course, these Roses are well cultivated, and this experience is a confirmation of my belief, often stated, that Roses will do well without irrigation on any land where an orchard will thrive, provided they have good cultivation.

I am frequently asked to name the twelve best Roses for our locality, and have made the attempt perhaps fifty times with as many different results, but in every list La France stood at the head—a place it is likely to hold for years to come. The red sport, Duchess of Albany, promises to stand pretty closely alongside the parent sort, but it seems a little weak yet from overpropagation, no doubt, and besides has by far too many imperfect flowers. A few years' propagating, by means of strong-selected cuttings from mature wood, will, no doubt, create a greatly improved strain of this race. The same will apply to Waban, the red sport from Catherine Mermet.

Oakland, Cal. *H. G. Pratt.*

New Cypripediums.

To the Editor of Garden and Forest:

Sir,—The following Cypripediums have recently flowered at the United States Nurseries, Short Hills, New Jersey:

Cypripedium lutescens.—This is the result of crossing C. Spicerianum with C. Javanicum. Leaves broad, rather long, thick, pointed, light green, beautifully tessellated with dark brown, with silvery cast underneath. Flower large, well proportioned; dorsal sepal large, recurved at the base, yellowish green, with few faint lines of darker green. Lower sepal small green; petals yellowish green suffused with lilac at the ends and spotted all over with very small brown purple spots. Lip large, rather long, green, shaded with brown; staminode of a beautiful lilac color.

Cypripedium Leeanum pulchellum.—A cross between C. insigne Nilsoni and C. Spicerianum. Leaves rather narrow, growth more compact than the type. Flower large, dorsal sepal recurved, dark green at the base. Petals drooping, spotted all over with small spots and margined with yellowish green. Lip large, heavily shaded with brown; staminode of a beautiful lilac color.

Cypripedium Leeanum lutescens.—A distinct type of C. Leeanum, on account of its yellowish green color, derived from a yellow variety of C. insigne, one of its parents. Flower large, well formed; dorsal sepal yellowish green at the base, with a few faint lines of spots of a light purple. Sepals and lip of the same color, slightly shaded with brown and spotted with brown-purple.

Short Hills, N. J. *Jos. Manda, Jr.*

Plant Labels.

To the Editor of Garden and Forest:

Sir,—With reference to the article in your issue of August 24th, I beg to state that the labels alluded to are manufactured by the Fabrik der Universal-Etiquetten, 5 Winkelried Platz, Bale, Switzerland. The ink is a marking ink, such as is commonly used for marking linen. These labels are neat, clean and very durable; but their great drawback is that the writing upon them must be done with ink and that they can be used but once, because this lettering cannot be effaced. Wooden labels painted white or yellow, on which one can write with a pencil, are still preferable, if they are made from wood felled in winter and seasoned for a year; but nowadays they make these from timber felled at any season of the year, and such labels are subject to fungus, which they communicate to the soil, and which is often destructive to delicate plants. Besides, wooden labels must be replaced and renewed in writing after a year or so.

I have used in the boxes where I keep my rarest plants glass labels, with good results. They are made of milky glass, which is dipped in some acid to take off the gloss and thus produce a soft surface, which is very agreeable to write upon. Characters traced with a hard pencil stand the weather well, and the labels look like porcelain, and are perfectly clean. By rubbing with emery-paper, sand and water, the writing can be perfectly effaced and the label used again. This form of label, too, has one great disadvantage—that is, a brittleness which makes it very liable to break.

What is wanted, especially for amateurs, public gardens and botanical establishments, is a label of some mineral material with a smooth surface, easy to write upon, of a pale or whitish color, which shows off the writing to best advantage; it must be possible to efface the letters somehow, and it must not be broken easily. Such a label might be made if inventors and manufacturers could only be brought to interest themselves in the matter.

Baden Baden. *Max Leichtlin.*

The River Garden at Coblenz.

To the Editor of Garden and Forest:

Sir,—The article in your issue of November 23d on the Rheinanlagen at Coblenz might have said much more of the great beauty of that garden without risk of overpraise, and its value to the city cannot be too highly estimated. I remember an exceptionally hot June morning there, a few years ago, when one thoroughly appreciated the facilities which the Anlagen offered for a shady stroll or quiet reading as one sat

near the river-bank, sheltered from the glare, but just able to catch the fresher air from the water. In an average American town of the same size one would have gone, not to a garden, but to the station, in order to get away as soon as possible, and the transient population would have consisted merely of those who could not get away. It would be interesting, from a practical point of view, to estimate the gain to the business interests of Coblenz from the influence of the Anlagen in inducing strangers to stop off and not to hurry away. It would be more interesting, from a philanthropic standpoint, to estimate the gain to the physical and mental health of the Coblenzers—to their life, in the fullest sense—from this ideal utilization of a part of their river-front.

Mount Airy, Philadelphia. *Charles C. Binney.*

Recent Publications.

The Beauties of Nature. By the Right Honorable Sir John Lubbock, Bart., M.P., F.R.S. New York: Macmillan & Co.

The subtitle of this volume, "The Wonders of the World We Live In," will perhaps more truly describe it than the words which appear on its cover, for the objects in the natural world which make the strongest appeal to our sense of beauty are not those chiefly discussed. There is an introduction of some forty pages, it is true, wherein the power of scenery to soothe and elevate is touched upon, and wherein we are treated to some descriptions of the quiet beauties of English landscape by Jefferies and Kingsley, while Humboldt is allowed to rhapsodize on the sublimities of a tropical night, Darwin is quoted to show the impressiveness of the boundless wastes of Patagonia, Professor Colvin writes of the chastened beauty of the scenery of Greece, and Wallace tells us how keen is the enjoyment which comes from color in sky and earth and water. But after this the reader finds little about beauty or any other single quality or phase of nature, for there is no pretense of any unity of purpose and hardly any connection of thought between the successive chapters or even between successive pages or paragraphs. It is not to be assumed from this that the book will be found uninteresting. The fifty pages devoted to plant-life treat in a pleasant way of some of the striking facts in the development of vegetation which botanical science has brought to light, and rather more space is given to the history and characteristics of a very small fraction of the two million or more species which make up the animal kingdom as it exists, not to speak of as many more that are extinct. Then we have a chapter on the Starry Heavens, with some account of the ordering of the countless hosts which wheel through infinite space. Still another chapter is devoted to the sea, with the mystery of its depths and the majesty of its swelling surface; another to the mountains and the forces which have lifted them up and are wearing them away; while yet another tells the story of the lakes and rivers, whence they took their origin and what directed their waters as they channeled their devious courses to the sea. The entire universe, with its history through unnumbered æons of astronomic time, is thus laid under contribution, and there seems no reason in any given instance why Sir John has selected one topic out of any given million, or why he has chosen to treat it in a particular way.

Of course, when astronomy, geology, botany, zoölogy and many subordinate branches of natural science find a place in a single volume, no subject can be exhaustively or comprehensively treated, but, after all, it may be said that the science is genuine. Unlike many other attempts to cast in popular form the results of learned research, the facts are stated with accuracy and clearness. Young people especially will find much in these fairly printed and attractively illustrated pages to give that pure delight which accompanies the widening of the horizon of their knowledge, and the bright boys and girls into whose hands they come cannot fail to have their attention arrested and their spirit of investigation stimulated.

Periodical Literature.

Most of our colonial towns have been made familiar to the present generation by repeated descriptions and illustrations. But, for some reason, Annapolis has not excited the same amount of attention. It is pleasant, therefore, to find, in a recent number of the quarterly *Architectural Record*, a delightful historical and descriptive account of it, written by Mr. T. Henry Randall, who was born within its verdant borders, but is now an architect of this city.

Essentially a countryman by preference, says Mr. Randall, the early colonial American of the southern states "loved above all things the comparative solitude of a great country home. When, however, his business or profession required him to live a part of the year in some town or city, we find, as a rule, the same general plan for the house followed as in the country; and the small allowance of room for garden, surrounded by a high brick wall, is laid out with the evident purpose of making it as secluded as circumstance would permit." In Annapolis this type of house and garden was developed better than anywhere else. "On the peninsula at the mouth of the Severn River, nearly surrounded by exquisite sheets of water, the first colonists found an ideal site for a prosperous town, and between it and the Chesapeake Bay a harbor which promised to give to it the commercial supremacy of the colony. Here they laid out their town, not at random, but with a fixed idea of making the most of all the advantages that the formation of the ground possessed, circumstances which, in later years, turned the tide of prosperity away from here and left this quaint old town almost unchanged for a century as 'the finished city of America.'

"From its infancy," Mr. Randall then explains, "Annapolis had a peculiar manner of development as unlike that of her sisters as their appearance differs to-day from hers. She did not begin with hurriedly built huts, scattered over the surface, that were transformed later into comfortable dwellings and arranged with order and symmetry; but from the very first her English colonists seem to have conceived a delightful ideal in the planning of their new city. As a starting-point, in the centre of the city, and upon the greatest elevation the peninsula afforded, they set apart a circle with a radius of 528 feet, which space was to be occupied by such buildings as were necessary for the officers of His Majesty's Government. To the west of this point they reserved another circle as the site of the church. From these two centres streets were laid out, radiating in all directions, and parallel with the river, and others were carried from the shores of the harbor to the opposite side of the city."

The House of Burgesses was built in the larger circle, and, when the seat of state government was hither transferred in 1694, the first state house was erected, while the first church was built in the smaller circle in 1699. A small area was reserved on the harbor for a dock and other commercial uses; and a triangular section of the city, connecting the state house with this area, was reserved for purposes of commerce and trade. Here small, closely built hipped-roofed dwelling-houses and large store-houses were built; and here, and in another district west of the church, the tradespeople lived and worked, while outside of these restricted limits they could do neither. An open area westward of the church was, indeed, reserved as a common for their enjoyment and use; but all the rest of the city, including almost the whole of its beautiful water-frontage, was given up to the residences of the more aristocratic citizens, the land being apportioned among them by the Lord Proprietor, some receiving the whole of one of the squares formed by the intersecting streets, and others one-fourth of a square. "Only a few houses," says our author, "have to-day their original terraced gardens leading to the water and overlooking the harbor and the creek, but these few are enough to give us a clear impression of what must have been the appearance of this charming old town when, in the height of its glory (1750–1776), its entire water-front, with the exception of the wharves and dock on the harbor, was lined with stately mansions surrounded by their gardens and partly hidden among luxuriant foliage. The houses were, as a rule, placed almost directly on the streets, with the walled gardens at the sides and rear. These gardens still show traces of the skill that was devoted to them. Covered porches were few and small, and piazzas were almost unknown to the early colonists. Shade-trees and arbors answered their purpose then, for our forefathers still adhered to their English habits of life, and it was left to succeeding generations to discover that this southern climate required marked alterations in the arrangements of their homes to secure perfect comfort and convenience."

We cannot here quote Mr. Randall's many detailed descriptions of these stately Annapolis homes, which are illustrated, moreover, by a large number of excellent photographs. But the buildings and gardens are dignified and attractive. Of "Acton," the homestead of the Murrays, he writes that it still has "splendid old trees, hedges, flower-garden and lawn stretching in all directions. The flower-garden itself, as we see to-day so often in England, is separated from the lawn by high hedges running down to the water's edge from the southern side of the house, divided into beds by curiously planned walks lined with Box." Of the Harwood or Lockerman House, built in 1770, he says: "The garden at the rear falls

gradually to the east. The old Box-borders of the flower-beds have long since overgrown the walks which they once followed, and are now great hedges, indicating still the landscape-gardener's plan as it originally existed." And of the Brice House we read: "The drawing-room is unusually beautiful, and commands an outlook over the entire garden." These extracts hint at the fact that the most important rooms do not lie, as we so often find them to-day, contiguous to the entrance. The street-front of the house contains the windows of the minor living-rooms and offices, while the state drawing-rooms and dining-rooms lie at the rear, facing the gardens, with windows and doors opening sometimes on stately porticos and sometimes directly upon the lawns and commanding the beautiful water-views. There is much instruction for the modern builder of detached houses in this varied series of beautiful pictures and their accompanying text, and they leave us convinced that much more would be afforded by an actual study of the town itself. Indeed, as we finish the article, we cannot but believe the author when he says: "Annapolis may still be called 'the finished city,' and those who love her quaint old streets, her well-shaded gardens and her dark red walls of brick, can see in them something which no other city in this land affords." And, regretting that his city has been so long neglected in favor of others less worthy of attention, we are doubly grateful to him for thus bringing it to our notice. But now we wish that some adept in the art of gardening would follow in Mr. Randall's footsteps and speak as fully of the surroundings of the old homes of Annapolis as he has spoken of the houses themselves.

Notes.

Professor Budd says that sheep are not as a rule destructive to orchards, but, on the contrary, they are efficient in keeping down insects. They only eat the bark of trees when the bark is the only obtainable green thing.

A Louisiana correspondent of the *Florida Times-Union* states that Citrus trifoliata is very satisfactory there as a hedge-plant, making an impenetrable barrier against man and beast, and occupying less space than one of Osage Orange or the Cherokee Rose.

Among the supplies now found in New York markets are strawberries from California at $1.75 a quart, Black Hamburg grapes from English hot-houses at $2.50 a pound, hot-house tomatoes from Boston at $1 a pound, new chicory from Louisiana at 20 cents a head, and fresh string beans from Florida for as much as customers can be induced to pay.

Dr. B. D. Halsted, of the Experiment Station at New Brunswick, New Jersey, is preparing a paper on diseases of the Carnation, to be read before the next meeting of the American Carnation Society, and he desires all persons who have any trouble with rusts or blights of that plant to send him affected specimens, so that he may be able to treat the subject as comprehensively as possible.

Dr. H. D. Warren, State Ornithologist of Pennsylvania, is preparing an exhibit of the fauna of that state for the Chicago Exposition. The foundation for this exhibit is the section of a mountain-side thirty-five feet long, twenty feet deep and eighteen feet high, and among the trees and undergrowth natural to an Alleghany forest-scene the birds and animals will be displayed in life-like positions and with their natural environment.

Mr. D. Nichol writes to the *Canadian Horticulturist* that the White Pine grows more rapidly on poor land in Canada than any other coniferous tree. He instances mixed plantations where White Pine trees have grown to be fifty feet high in twenty-two years, with every tree as straight as a mast, and this growth has been attained on poor land without any cultivation beyond thinning out the trees as they grew large and clearing away decayed under-branches. No other kind of forest-trees does so well when grown so closely.

Eulalia gracillima univittata is one of the most graceful of the noble hardy grasses, and its beauty and usefulness in the garden have become well known. It does not seem to have been noted that its ripening stems and leaves in autumn take on fiery brown tints, so that bold clumps of it are luminous objects in the garden till winter sets in. This coloring is peculiar to this variety, the other kinds simply fading out as they ripen. Like other Eulalias, this is furnished with the plumes which are the most graceful of those borne by any of the grasses.

The Massachusetts State Board of Agriculture has issued another edition of the descriptive catalogue of abandoned farms, from which it appears that of the 339 farms originally advertised fifty-one have been sold, the owners of twenty-two others wished to have the description withdrawn, 178 owners wish the description continued, while there are eighty-eight farms from which nothing has been heard. But few of the farms disposed of have been taken for summer residences, the greater number of purchasers being Massachusetts men. The farms sold averaged 88.35 acres each, and brought altogether $75,550, or an average of $1,480 each.

A writer in the *Southern Stockman* says to test the ripeness of a Water Melon, the thumb-nail should be drawn over it so as to scrape off the thin green skin. If the edges of the skin on each side of the scar are left ragged and granulated, and the rind under the scar is smooth, firm, white and glossy, the melon is ripe. If the edges of the scar are smooth and even and the nail plows into the rind in places and the skin does not come off clean, then the melon is green. Two melons, one known to be ripe and the other green, should be taken and this test practiced on them until the difference is plainly observed.

After his address on orchard fruits, delivered before the Massachusetts State Board of Agriculture a fortnight ago, Mr. J. H. Hale, who is perhaps the most successful grower of peaches in New England, replied to a volley of questions from his auditors. The off-hand answers were quite as good as the address, and we add a few of them. Peaches should be fed with chemical fertilizers only. We apply every year all we can afford, that is, about 1,200 pounds of bone and from 400 to 800 pounds of muriate of potash to the acre. Too much is better than not enough. Sulphate of potash gives the best color to peaches, but cotton hull ashes is perhaps a better form of potash. Yellow-fleshed peaches have more tender fruit-buds than other kinds. We shorten in the new wood from one-third to one-half in the spring when the fruit-buds begin to swell. We can get a good peach crop with 90 per cent. of the buds winter-killed. After the fruit is set for a full crop we thin until there are no two peaches within from four to six inches of each other. This is a costly treatment, but it pays. The extras sell for six times as much per peach as the seconds do, and they do not exhaust the tree as much. The finest fruit this year came from fourteen-year-old trees. An elevated plain is not as good for a Peach orchard as a hill-side with a sharp decline. The fruit should be fully mature, but not mellow, when it is picked. Pickers are trained to judge ripeness by color. Peach-orchards should not be cultivated after the middle of July.

John Strong Newberry, professor of geology in Columbia College, died last week at Windsor, Connecticut, in his seventieth year. Professor Newberry was born in Windsor, Connecticut, in 1822 and was graduated from the Western Reserve College in 1846; then, after studying medicine at the Cleveland Medical College, he devoted two years to travel and study in Europe, and later established himself as a physician in Cleveland. In 1855 Dr. Newberry, in order to gratify his taste for science, obtained an appointment as Acting Assistant-Surgeon in the United States Army, and accompanied the expedition under Lieut. R. S. Williamson which explored the territory lying between San Francisco and the Columbia River, acting as surgeon and geologist. In 1858 he was attached in the same capacity to the expedition which, under command of Lieut. J. C. Ives, made the first exploration of the basin of the Colorado River of the west. In 1859 Dr. Newberry explored the country bordering the upper Colorado and San Juan Rivers, and during the war of secession rendered important service to the army as a member of the United States Sanitary Commission. In 1856 he was appointed professor of geology in the School of Mines, Columbia College, the position he occupied at the time of his death. Dr. Newberry's scientific publications are numerous and valuable. They were principally devoted to geology, and of late years mainly to paleontology. In 1860 he published a catalogue of the flowering plants and ferns of Ohio, but his most important contributions to botany are found in the sixth volume of the *Pacific Railroad Reports*, in which is printed his report of the plants collected on the Williamson expedition, with remarks upon the geographical botany of the region traversed, followed by a description of the forest-trees of northern California and Oregon, a paper which contains the fullest and most exact information upon these trees which has yet been published. Professor Newberry's service to botany is commemorated in Newberrya, a genus of leafless Ericaceous plants, dedicated to him by Torrey, which he discovered in the Cascade Mountains of Oregon.